

### **Amendments to the Claims:**

The listing of claims will replace all versions, and listings, of claims in the application:

### **Listing of Claims:**

37. (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by a recombinant process.

38. (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by a chondroitin synthase.

39. (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by a *Pasteurella multocida* chondroitin synthase.

40. (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by the *Pasteurella multocida* chondroitin synthase of SEQ ID NO:2 or 4.

41. (original): A purified composition, wherein the purified composition comprises a chondroitin polymer made by the *Pasteurella multocida* chondroitin

synthase comprising the nucleotide sequence in accordance with SEQ ID NO:1 or 3.

42. (currently amended): The purified composition of claims 37, 38, 39, 40, and 41, ~~and 42~~, wherein the chondroitin polymer is represented by a structure, (Beta-1,4-GlcUA-beta-1,3-GalNAc)<sub>n</sub> wherein n is a positive integer greater than or equal to 1 and the chondroitin polymer is unsulfated.

43. (currently amended): ~~A~~ The purified composition of claim 42, wherein the purified composition comprises a chondroitin polymer having a modified size distribution.

44. (currently amended): ~~A~~ The purified composition of claim 42, wherein the purified composition comprises a chondroitin polymer having a modified structure.

45. (canceled)

54. (canceled)

55. (canceled)

59. (canceled)

60. (canceled)

111. (currently amended): A An unsulfated chondroitin polymer produced *in vitro* by the method comprising the steps of:

- providing a chondroitin synthase;
- placing the chondroitin synthase in a ~~medium~~ reaction mixture suitable for the ~~expression~~ production of a an unsulfated chondroitin polymer; and
- extracting the unsulfated chondroitin polymer out of the medium.

112. (currently amended): The unsulfated chondroitin polymer of claim 111, wherein in the step of providing a chondroitin synthase, the chondroitin synthase is from *Pasteurella multocida*.

113. (currently amended): The unsulfated chondroitin polymer of claim 112, wherein in the step of providing a chondroitin synthase, the chondroitin synthase is from *Pasteurella multocida* and has an amino acid sequence as set forth in SEQ ID NO:2 or 4.

114. (currently amended): The unsulfated chondroitin polymer of claim 112, wherein in the step of providing a chondroitin synthase, the chondroitin synthase from *Pasteurella multocida* is a nucleotide sequence as set forth in SEQ ID NO:1 or 3.

115. (currently amended): ~~A~~ An unsulfated chondroitin polymer produced *in vivo* by the method comprising the steps of:

- providing a chondroitin synthase gene;
- placing the chondroitin synthase gene in a native or recombinant organism, thereby providing a native or recombinant organism having a chondroitin synthase therein;
- placing the native or recombinant organism having a chondroitin synthase therein in a medium suitable for the expression of a an unsulfated chondroitin polymer; and
- extracting the unsulfated chondroitin polymer.

116. (currently amended): The unsulfated chondroitin polymer of claim 115, wherein in the step of providing a chondroitin synthase, the chondroitin synthase is from *Pasteurella multocida*.

117. (currently amended): The unsulfated chondroitin polymer of claim 116, wherein in the step of providing a chondroitin synthase, the chondroitin synthase gene is from *Pasteurella multocida* and has an amino acid sequence as set forth in SEQ ID NO:2 or 4.

118. (currently amended): The unsulfated chondroitin polymer of claim 116, wherein in the step of providing a chondroitin synthase, the chondroitin synthase from *Pasteurella multocida* is a nucleotide sequence as set forth in SEQ ID NO:1 or 3.

119. (currently amended): A An unsulfated chondroitin polymer, produced by the method comprising the steps of:

- introducing a purified nucleic acid segment having a coding region encoding enzymatically active chondroitin synthase into a host organism, wherein the host organism contains nucleic acid segments encoding enzymes which produce UDP-GlcUA and UDP-GalNAc;
- growing the host organism in a medium to secrete an unsulfated chondroitin polymer; and
- recovering the secreted unsulfated chondroitin polymer.

120. (currently amended): The unsulfated chondroitin polymer of claim 119, wherein in the step of recovering the unsulfated chondroitin polymer, the unsulfated chondroitin polymer is extracted from the medium or the cells or combinations thereof.

121. (currently amended): The unsulfated chondroitin polymer of claim 120, further comprising the steps of purifying the extracted unsulfated chondroitin polymer.

122. (currently amended): The unsulfated chondroitin polymer of claim 119, further comprising the step of sulfating the chondroitin polymer.

123. (currently amended): The unsulfated chondroitin polymer of claim 119, further comprising the step of epimerizing the chondroitin polymer.

124. (currently amended): The unsulfated chondroitin polymer of claim 119, wherein in the step of growing the host organism, the host organism secretes a structurally modified unsulfated chondroitin polymer.

125. (currently amended): The unsulfated chondroitin polymer of claim 119, wherein in the step of growing the host organism, the host organism

secretes a an unsulfated chondroitin polymer having a modified size.

127. (currently amended): A An unsulfated chondroitin polymer produced by a process of fermentation of a cell expressing a chondroitin synthase enzyme having an amino acid sequence in accordance with SEQ ID NO:2 or 4.

128. (original): A chondroitin polymer produced by a process for the *in vitro* sulfation of a chondroitin polymer, wherein the chondroitin polymer is produced by a chondroitin synthase and the chondroitin polymer is sulfated by either chemical or enzymatic means.

129. (original): The chondroitin polymer of claim 128, wherein the chondroitin synthase is a *Pasteurella multocida* chondroitin synthase.

130. (original): The chondroitin polymer of claim 129, wherein the *Pasteurella multocida* chondroitin synthase is as set forth in SEQ ID NO:2 or 4.